



# **Armed Forces College Of medicine AFCM**



# Good Morning

When the world says, "Give up,"  
Hope whispers, "Try it one more time."

Hope is that thing with feathers that perches in the soul and  
sings the tune without the words and never stops... at all.

Take Care







# **Pathology of aneurysms & varicose veins**

***Prof. Eman Abdelbary***



# Intended Learning Objectives (ILOs)



**By the end of this lecture the student will be able to:**

1. Identify causes, types and complications of aneurysms
2. Differentiate between different types of aneurysms
3. Identify sites, predisposing factors & complications of varicose veins
4. Correlate between causes, pathological features and complications of varicose veins



# Lecture Plan



1. Part 1 (30 min): Definition, aetiology and types of aneurysms
2. Part 2 (10 min): Definition, Aetiology & pathological features of varicose veins
3. Lecture Quiz (5 min)



# Aneurysms



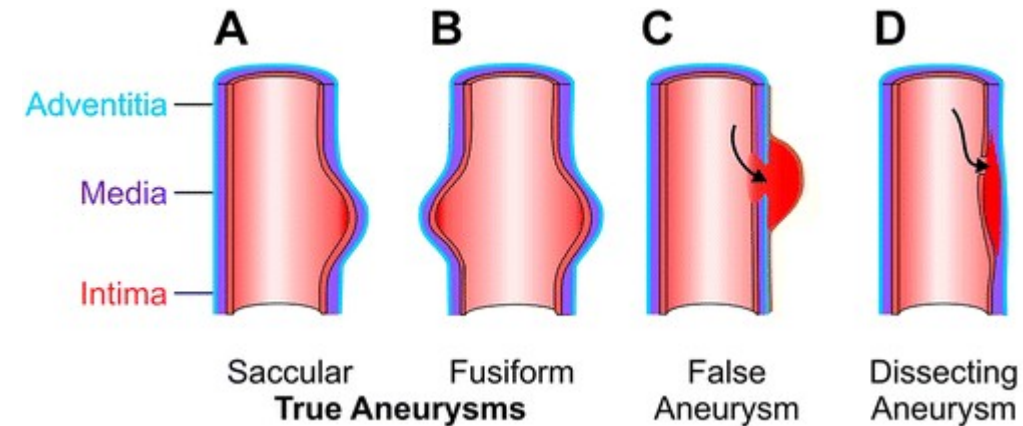
## :Types

**True**

**Def:** Localized dilatation of the arterial wall

**False**

The wall of the aneurysm is formed of fibrous tissue & not a part of the arterial wall





# True Aneurysms



## ***:Etiology***



**Hypertension**

**Weakening of the media**

**Congenital**

**Atherosclerosis**

**CT abnormality**

**Inflammatory**

**At bifurcation of arterial wall**

- **Subacute infective endocarditis**
- **Vasculitis**





# True Aneurysms



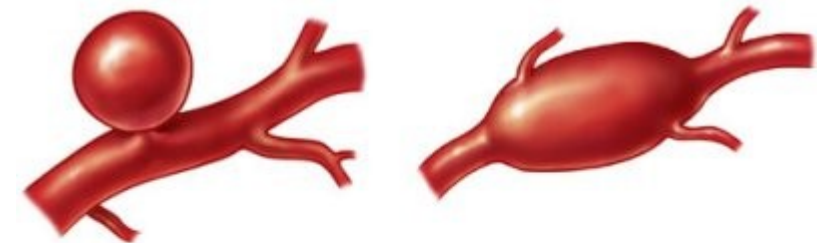
***Classification according to the **SHAPE**:***

***1- Saccular aneurysm:***

**Outpouching from one side of the arterial wall, often containing a thrombus**

***2- Fusiform aneurysm:***

**Circumferential dilatation of the arteria**



Saccular Aneurysm

Fusiform Aneurysm



Ruptured Aneurysm



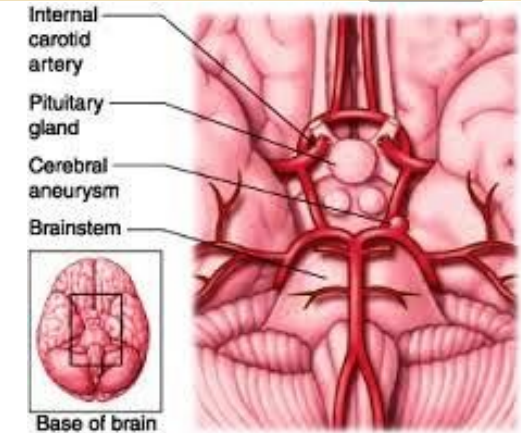
# True Aneurysms



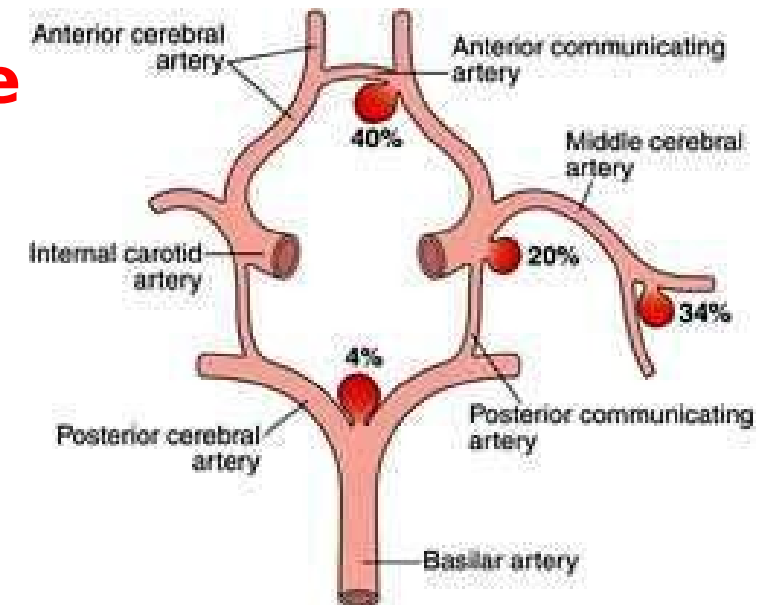
## *Classification according to ETIOLOGY:*

### *1- Congenital (Berry)*

- **Multiple small aneurysms**
- **Due to: congenital **absence of the media****
- **At the bifurcation of cerebral arteries **in the circle of Willis****
- **If rupture: Cerebral / subarachnoid hemorrhage**



<https://userscontent2.emaze.com/images/492d41e7-8d06-4383-be8c-eeee90e66b5d/4962a4e62b7e7cb5f2abcbd5682c9561.png>



<https://www.oytunerbas.com.tr/wp-content/uploads/2014/05/kanama.png>



# True Aneurysms



**Classification according to**

**etiology: sclerotic**

**Due to: weakening of media due to pressure**

**atrophy & ischemia secondary to atheroma**

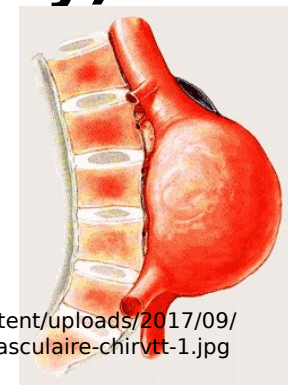
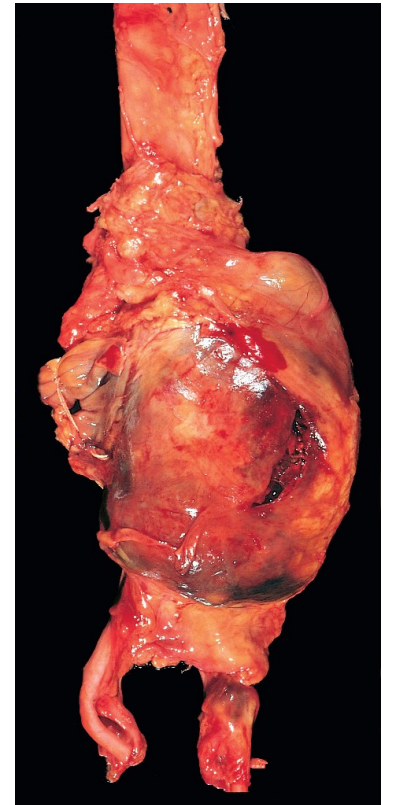
**Large & fusiform aneurysms**

**At the abdominal aorta (distal to renal artery) & cerebral arteries (*most common*)**



Fusiform Aneurysm

<https://raquelfotos.rr1.com.br/txdoencasvasculares/aneurismatipos.jpg>



<http://www.chirvtt.fr/wp-content/uploads/2017/09/anevrisme-aorte-chirurgie-vasculaire-chirvtt-1.jpg>

[https://cdn.goconqr.com/uploads/flash\\_card/image\\_question/4660770/desktop\\_e96e2099-096d-4fae-ac80-5e470ee897de.PNG](https://cdn.goconqr.com/uploads/flash_card/image_question/4660770/desktop_e96e2099-096d-4fae-ac80-5e470ee897de.PNG)



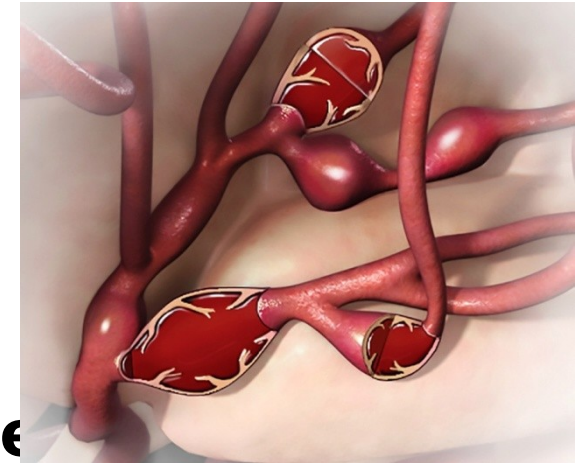
# True Aneurysms



*Classification according to*

*3- Mycotic aneurysms:*  
*etiology:*

- Small inflammatory aneurysms
- At small arteries (cerebral, mesenteric, coronarie)
- **Occur in case of:** Subacute bacterial endocarditis, polyarteritis nodosa →
- **Due to** inflammatory weakening & **fibrosis** of the media wall stretching under pressure





# True Aneurysms



*Classification according to*

*etiology: Aortic dissection (Dissecting aneurysms):*

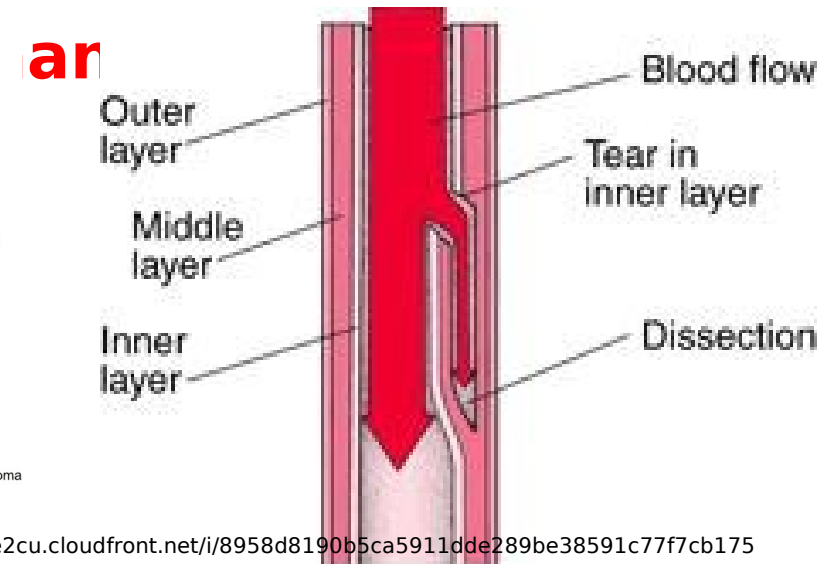
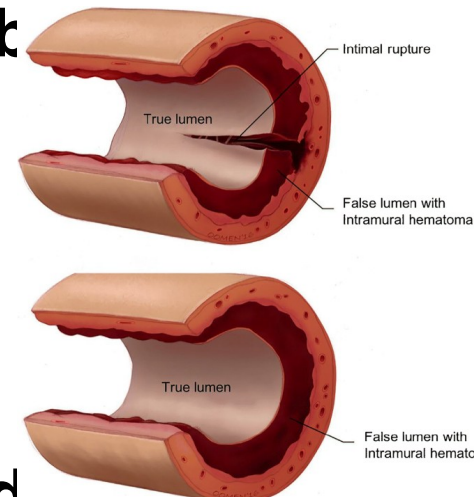
❖ Def: An aneurysm in which the wall of the artery dissects longitudinally.

❖ It occurs when bleeding into the weakened wall **splits the media** it two layers, creating a **new arterial wall**.

❖ Uncommon

❖ Affects aorta due to:

- **Atherosclerosis: Common, old age**





# True Aneurysms



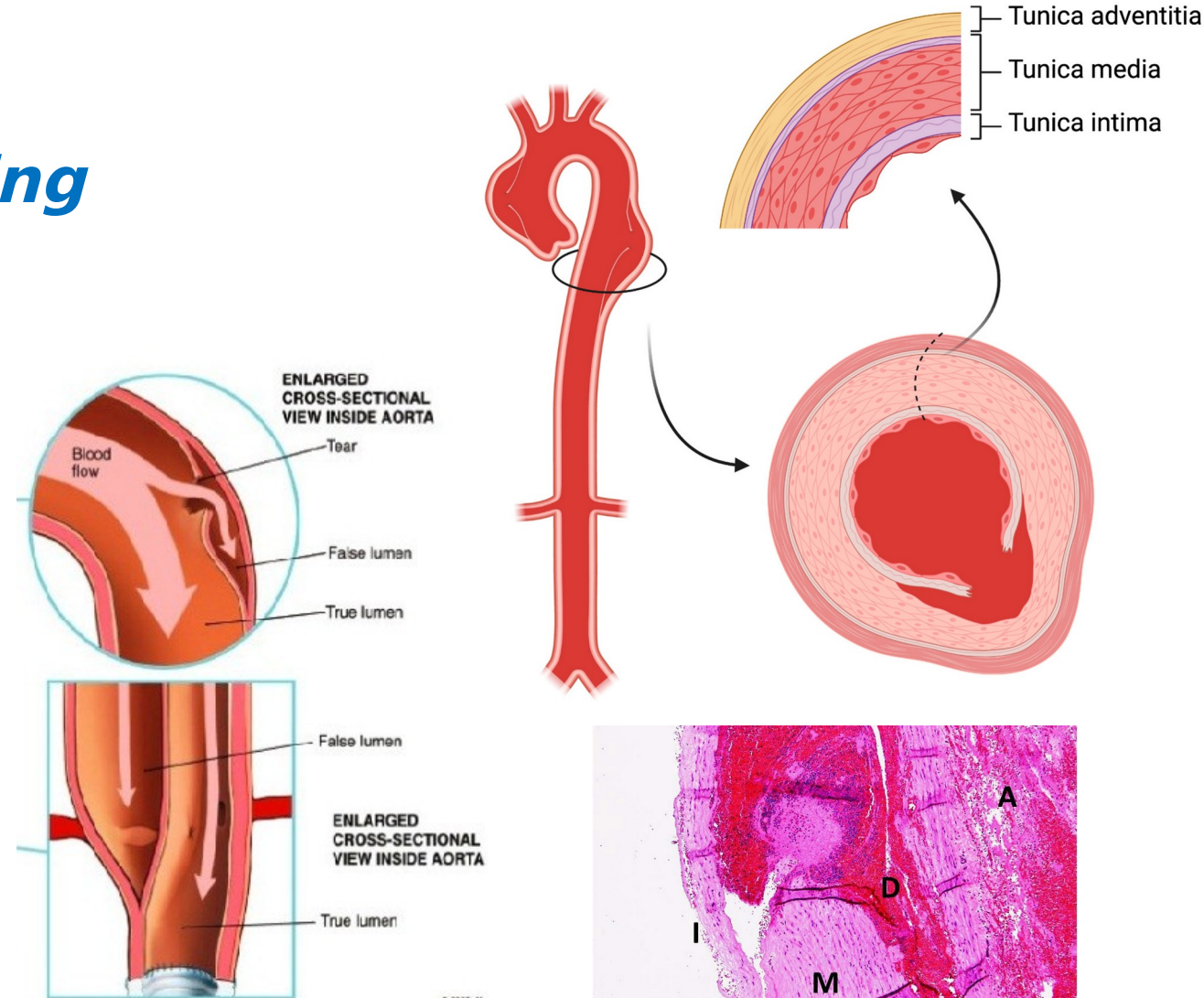
## Classification according to etiology: 4- Aortic dissection (Dissecting aneurysms):

**A) Atherosclerosis:**  
A crack in atheromatous wall ← Hypertension

Blood is forced into aortic wall

Blood splits the media

May extend to aortic branches





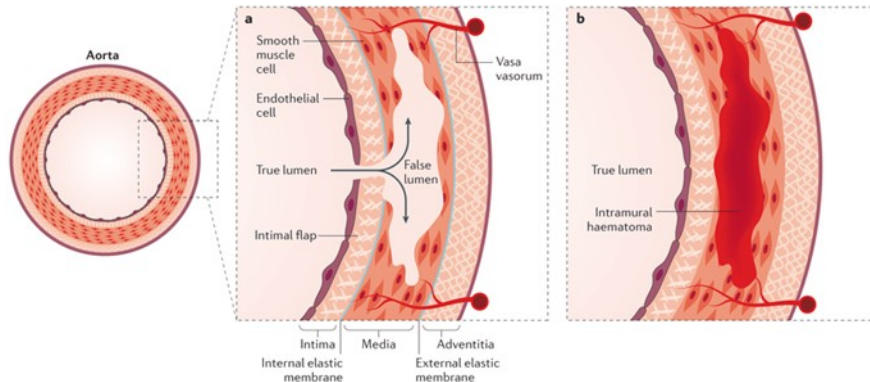
# True Aneurysms



**Classification according to etiology:**

**A) Dissecting aneurysms:**

**B) Connective tissue abnormality (Marfan syndrome)**



<https://patologiacardiovascular.files.wordpress.com/2012/01/39-3110085-plad-dissection.jpg>

C.T. abnormality in the wall of the aorta

(congenital absence of **fibrillin**)  
Weakening of the musculoelastic

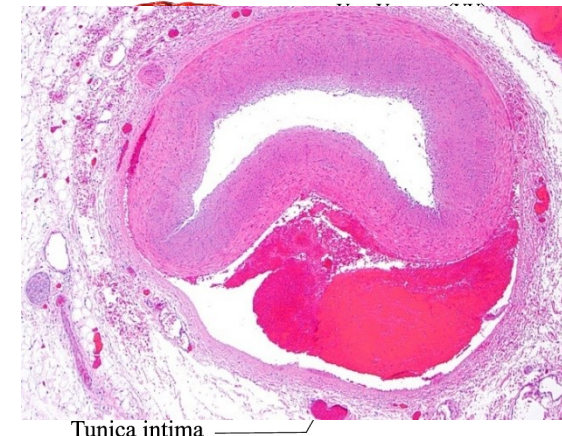
tissue

Rupture of vasa vasorum

Intramural

hemorrhage

Splitting of media in two layers without intimal tear





```
graph LR; A[Complications of Aortic Aneurysm] --> B[Pressure on the surroundings e.g. vertebrae]; A --> C[Thrombosis & embolism]; A --> D[Ischemia]; A --> E[Rupture & hemorrhage];
```

**Pressure on the surroundings e.g. vertebrae**

**Thrombosis & embolism**

**Ischemia**

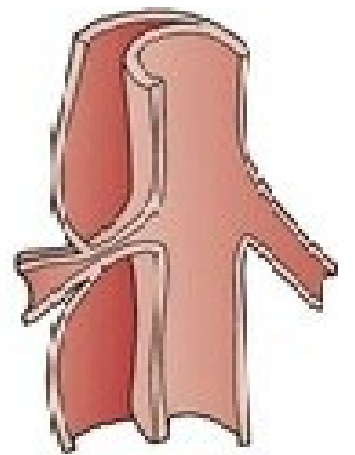
**Rupture & hemorrhage**

```
graph LR; A[Dissection extend to aortic branches & coronaries] --> B[obstruction ischemia]; C[Rupture] --> D[Inner layer]; C --> E[whole aneurysm]; D --> F[Improved condition]; E --> G[fatal hemorrhage];
```

❖ **Dissection extend to aortic branches & coronaries** → **obstruction ischemia**

❖ **Rupture** → **Inner layer** → **Improved condition**

                    → **whole aneurysm** → **fatal hemorrhage**





# False Aneurysms



**Synonyms:** *Pseudo-aneurysm, pulsating*

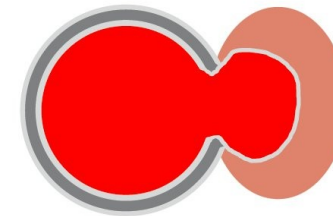
**Pathogenesis:**

Traumatic arterial  
injury  
↓  
Periarterial hematoma

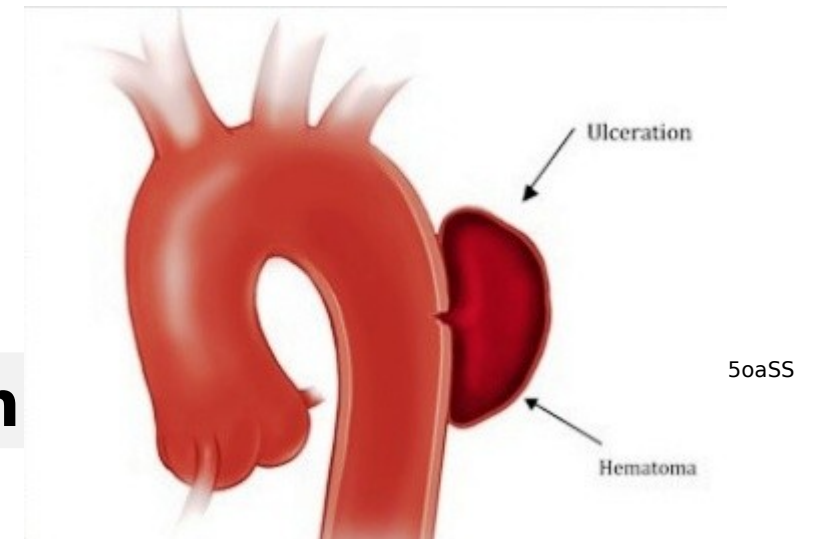
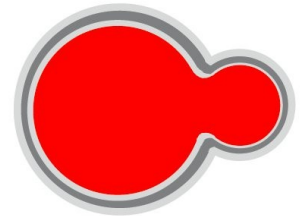
↓  
Fibrous organization at the periphery

↓  
A sac communicating with arterial lumen

Pseudoaneurysm



True Aneurysm





## *Definition, aetiology and types of aneurysms (Quiz)*



A 63-year-old woman presents to the emergency room with sudden onset of severe chest pain radiating to the back and extending to the abdomen. She has been previously healthy except for a history of poorly controlled hypertension. Her blood pressure is 150/100 mm Hg. Laboratory findings reveals normal serum level of LDH and CPK and high serum cholesterol level. Which of the following is the most likely diagnosis?

- A Fibrinous pericarditis
- B Aortic dissection
- C Infective endocarditis
- D Dilated cardiomyopathy
- E Myocardial infarction



## *Definition, aetiology and types of aneurysms (Quiz)*



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# Varicosities



***Definition*** Abnormally dilated, elongated & tortuous veins

## ***Sites:***

- Long saphenous vein in lower limbs (varicose veins)
- Pampiniform plexus in spermatic cord (varicocele)
- Hemorrhoidal veins in anal canal (piles/ hemorrhoids)
- Veins at lower esophagus (esophageal varices)





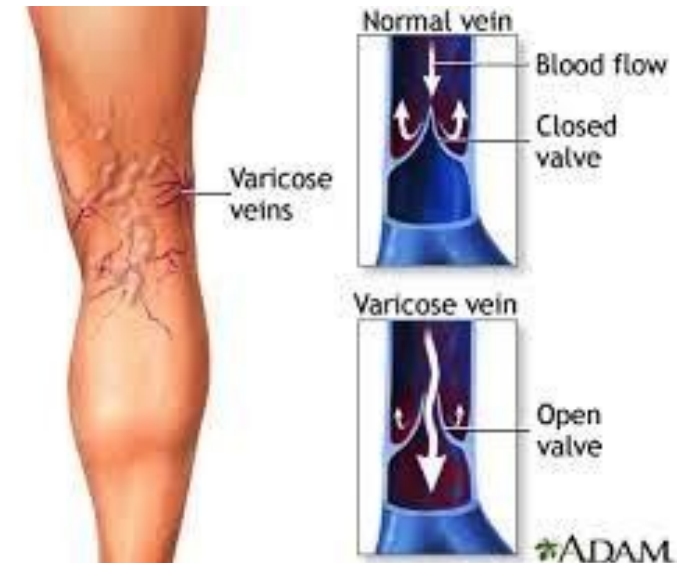
# Varicosities



## *Predisposing factors of varicose*

### *veins:*

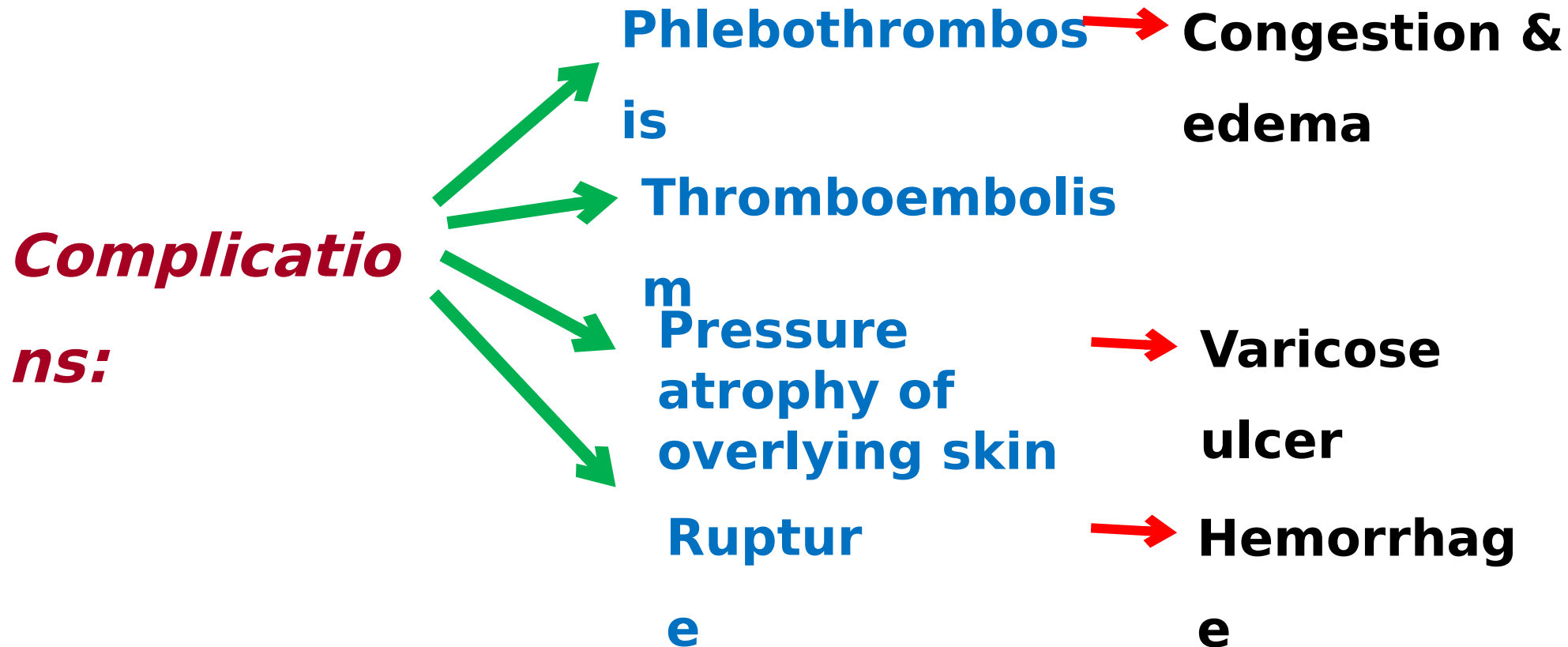
- **Incompetent venous valves**
- **Congenital weakness of the venous wall**
- **Acquired weakness of venous wall: (senility, obesity)**
- **Increased intraluminal pressure: Prolonged standing, pregnancy, thrombosis, constipation**



<https://i.pinimg.com/originals/be/fd/55/befd5597434a6e50bdbefc2d734a4b19.jpg>



# Varicosities





## *Definition, Aetiology & pathological features of varicose veins (Quiz)*



A 55-year-old grocery store cashier with an 8-month history of leg edema increasing over the course of a work day, associated with moderate to severe lower leg pain. On physical examination, there are dilated, tortuous leg veins. What is the possible complication of her condition?

- A Systemic pyaemia.
- B Venous thrombosis.
- C Heart failure.
- D Lung abscess.
- E Moist gangrene of the foot.



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## ***Key points:***



- The wall of true aneurysm is a part of arterial wall, while that of false aneurysm is usually formed of fibrous tissue
- Types of true aneurysm include congenital, atherosclerotic, mycotic and dissecting aneurysms
- Complications of aneurysms are pressure atrophy on the surroundings, thrombosis & embolism, ischemia and rupture
- Varicose veins results from obstructive or non obstructive causes



# Suggested Textbooks



1. Mitchell R. Blood vessels. In Robbins and Cotran pathologic basis of disease, 10<sup>th</sup> edition. Kumar, Abbas & Aster (eds). Elsevier Saunders. Pages 487 to 491.
2. USMLE step 1 lecture notes, 2017. Kaplan INC, New York. Pages 103

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